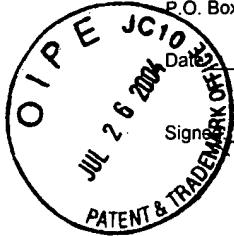


I hereby certify that this correspondence is being filed by
depositing it with the United States Postal Service as first
class mail in an envelope with sufficient postage and addressed
to MS: Fee Preliminary Amendment, Commissioner of Patents,
P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

July 20, 2004

Peter K. Trzyna (Reg. No. 32,601)



ISW
PATENT

Paper No.

File No. Contcir-P1-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors : Brian J. McDermott, Jr., Daniel McGowan, Ralph
Leo Spotts, and Sid Tryzbiak

Serial No. : 10/790,363

Filed : March 1, 2004

For : Electrical Device with Teeth Joining Layers and Method for
Making the Same

Group Art Unit : 2827

Examiner : Dinh, Tuan T.

Assistant Commissioner of Patents
Washington, D.C. 20231

TRANSMITTAL LETTER

SIR :

Transmitted herewith for filing in the above-identified patent application is the
following:

1. Preliminary Amendment;
2. Petition to Accept Color Photographs and Amendment;
3. Substitute Specification Page 6; and
4. Three (3) sets of color drawings on proper paper, Figs 1-2, Sheet 1/2 to
replace Sheet 1/2 previously filed.

The Commissioner is hereby authorized to charge any fees associated with the

above-identified patent application or credit any overcharges to Deposit Account No. 50-0235.

Please direct all correspondence to the undersigned at the address given below.

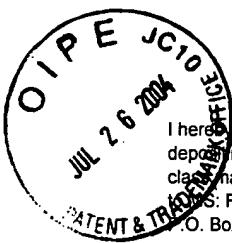
Respectfully submitted,



Peter K. Trzyna
(Reg. No. 32,601)

Date: July 20, 2004

P.O. Box 7131
Chicago, IL 60680
(312) 240-0824



I hereby certify that this correspondence is being filed by depositing it with the United States Postal Service as first class mail in an envelope with sufficient postage and addressed to: Fee Preliminary Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

Date: July 20, 2004

Signed:

Peter K. Trzyna (Reg. No. 32,601)

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Group Art Unit : 2827

Examiner : DINH, TUAN T

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PETITION TO ACCEPT COLOR PHOTOGRAPHS AND AMENDMENT

SIR:

Enclosed please find three (3) sets of color drawings (photographs) on proper paper for examination, copying, and archival purposes, for replacement of Figures 1 and 2, of sheet 1 of 2 of the drawings. Please amend the specification upon allowance of this Petition by inserting the following language as the first paragraph of the specification beginning a Brief

Description of the Drawings, at page 6, line 2:

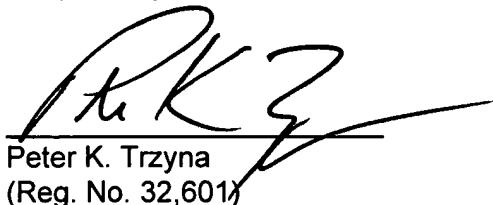
The file of this patent contains at least one drawing executed in color. Copies of this patent with the color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee.

Substitute Specification Page 6 is enclosed. The parent application was initially filed with color photographs as Figures 1 and 2, and later, formal drawings replaced the photographs. See file history of Ser. No. 08/905,619, now U.S. Patent No. 6,141,870. A related second application incorporated by reference from the parent patent application. See file history of Ser. No. 09/694,099, now U.S. Patent No. 6,700,069. The instant related patent application incorporates by reference both the parent and the second application, as stated at the first line of page 2 of the application. Because the photographs were replaced, there is no new matter in re-replacing the drawings with the photographs.

The color photographs are believed by the undersigned to be the best practical medium to illustrate subject matter to be patented. The Examiner is directed to the drawings Figures 1 and 2, in comparison to the corresponding photographs Figures 1 and 2 to see that the color photographs provide contrast not available in black and white drawings.

The Commissioner is hereby authorized to charge any fees associated with the above-identified patent application or credit any overcharges to Deposit Account No. 50-0235. Additionally, the Examiner is invited to contact the undersigned at (312) 240-0824 if it can in any way expedite or ease the handling of this case. Please direct all correspondence to the undersigned at the address given below.

Respectfully submitted,



Peter K. Trzyna
(Reg. No. 32,601)

Date: July 20, 2004

P.O. Box 7131
Chicago, IL 60680-7131
(312) 240-0824

Substitute Page 6

IV. BRIEF DESCRIPTION OF THE DRAWINGS

The file of this patent contains at least one drawing executed in color. Copies of this patent with the color drawing(s) will be provided by the Patent and Trademark Office upon request and 5 payment of the necessary fee

Figure 1 is an illustration of a conductive coating and metal layer applied dielectric material with a desirable tooth structure;

Figure 2 is an illustration of a prior art conductive coating and metal layer on the applied dielectric material with the surface produced by roughening processes;

10 Figure 3 is an illustration of a double sided printed circuit board without plated through holes;

Figure 4 is an illustration of a multilayer printed circuit board with plated through holes, filled or unfilled with conductive or nonconductive material;

Figure 5 is an illustration of a multilayer printed circuit board without plated through holes;

15 Figure 6 is an illustration of a multilayer printed circuit board having more than two layers with plated through holes filled or unfilled with conductive or nonconductive material;

Figure 7 is an illustration of any of the foregoing printed circuit boards after applying a dielectric material thereon;

Figure 8 is an illustration of the multilayer printed circuit board of Figure 7 after forming micro vias;

20 Figure 9 is an illustration of the multilayer printed circuit board of Figure 7 after opening the through holes and after etching the applied dielectric material to produce the teeth illustrated in Figure 1;

Figure 10 is an illustration of the multilayer printed circuit board of Figure 9 after application of a conductive coating to fill in around the teeth and connect micro via holes and the through holes; 25 and

Figure 11 is an illustration of the multilayer printed circuit board of Figure 10 after plating the conductive coating to form a metal layer and complete forming circuitry.